B&B ELECTRONICS

Models: 4WSD9OTB/4WSD25OTB

Isolated Universal Converters

RS-232, 4-wire RS-422, 2-wire or 4-wire RS-485

CE

Features

- ✓ **High Speed Communications. Supports data rates up to 115.2 kbps.**
- ✓ **Extended communications. Supports distances up to 4000 ft (1200 m).**
- ✓ **Removable terminal blocks for easy RS-422/RS-485 connections.**
- ✓ **Switchable modes. Supports 2-wire RS-485, 4-wire RS-485, and full duplex RS-422.**
- ✓ **Automatic RS-485 driver control. External software modifications are not required.**
- ✓ **2000 VAC isolation. Reliable in harsh electrical conditions.**

Functional Description

Isolates and converts RS-232 signals into RS-422 / RS-485 signals and vice versa. Unlike other converters, external software is not required to control data flow. The RS-232 input is wired for DCE and interfaced through a female DB25 or DB9 connector. RS-422 or RS-485 signals are connected to a removable terminal block. External power is applied to separate removable terminal block. A 10 – 48 VDC power supply (not included) is required.

Ordering Information

Model Number	Description
4WSD9OTB	Converter with female DB9 RS-232 Connector
4WSD25OTB	Converter with female DB25 RS-232 Connector
7175	Power 2-position Terminal Block – one included
7372	Data 5-position Terminal Block – one included
9PAMF6	6ft. Serial Cable DB9M to DB9F
485PS2	120 VAC to 12 VDC Power Supply
PS2EU-1000	220/240 VAC to 12 VDC Power Supply; 2-Prong Euro Plug
PS2UK-1000	220/240 VAC to 12 VDC Power Supply; 3-Prong UK Plug

PRODUCT INFORMATION

Operation

- Configure operating mode using guidance in Table 1.
- Common Applications are discussed in Figures 1 through 3.
- RS-232 connection requires RD, TD, and Signal Ground. The remaining signals are looped back within the converter as shown in Table 2.
- In half duplex operation, the receiver is enabled when not transmitting (Echo Off).
- In RS-422 mode, the driver is always enabled.
- In RS-485 mode, the RS-485 driver is automatically enabled during each space state by the presence of an RS-232 signal. When the RS-232 data is in a mark or idle state, the RS-485 driver is disabled and the RS-485 data lines are held in a mark state by the bias provided by a 4.7K Ω resistor. The value of this resistor may need to be changed depending on the termination used.
- Refer to B&B Electronics' RS-422/RS-485 Application Note for detailed information concerning RS-422 and RS-485 networks. This document is available for download at http://www.bb-elec.com/tech_articles.
- The loopback test mode switch is used with hyper terminal to verify the operation of the converter. Additional troubleshooting guidance is available at http://www.bb-elec.com/technical_library.asp.

Table 1 – Operating Mode Switch Settings

Switches	Switch 1 (Tx)	Switch 2 (Rx)	Switch 3 (bridge)	Switch 4 (bridge)
Operating Mode				
RS-485 2-Wire Mode (half duplex)	RS-485	Echo Off	2-Wire	2-Wire
RS-485 4-Wire Mode (full duplex)	RS-485	Echo On	4-Wire	4-Wire
RS-422 4-Wire Mode (full duplex)	RS-422	Echo On	4-Wire	4-Wire
Loopback Test Mode*	As Desired	Echo On	2-Wire	2-Wire

- Used with HyperTerminal or another terminal program to confirm operation of data through converter.

Table 2 – RS-232 Pin-out

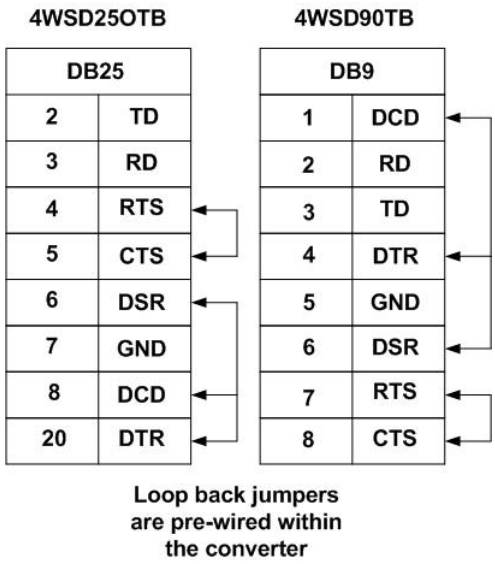

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Figure 1: 2-Wire RS-485

- Used to connect several RS-485 devices with minimal wire.
- Devices communicate one at a time.
- Units are normally in receive mode.
- When data is requested, the addressed device waits one delay time before responding.
- After transmitting, the device reverts to receive.
- Switch settings are: Switch 1: RS-485, Switch 2: Echo Off, Switches 3 and 4 to 2-Wire.

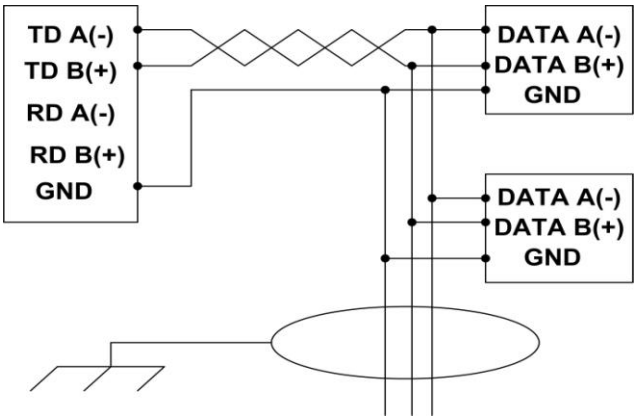

Figure 2: 4-Wire RS-485

- Used for 4-Wire Master/Slave circuits.
- Each device is polled, allowing faster response time.
- Addressed devices can receive while responding to a request.
- When used as a Master in a single master system, Switch 1 may be set RS-422 since it is the only transmitter.
- When used as a slave, the RS-232 device must provide addressability. Select RS-485 mode in this situation.
- Biasing is provided by the end-of-line slave.
- Switch settings for this mode are : Switch 1: RS-485**,** Switch 2: Echo On, Switches 3 and 4: 4-wire.

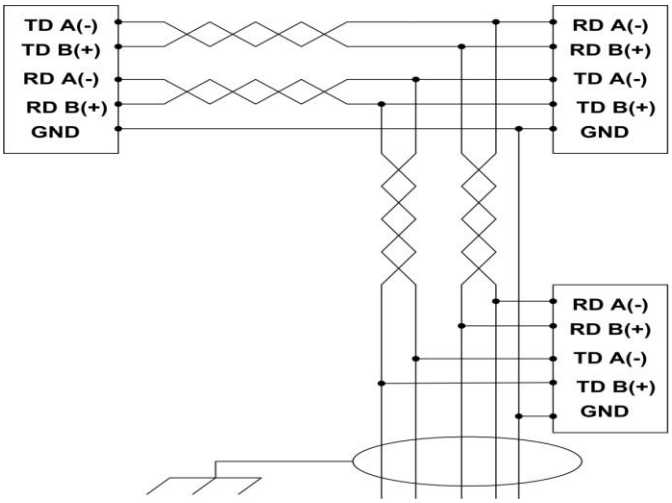

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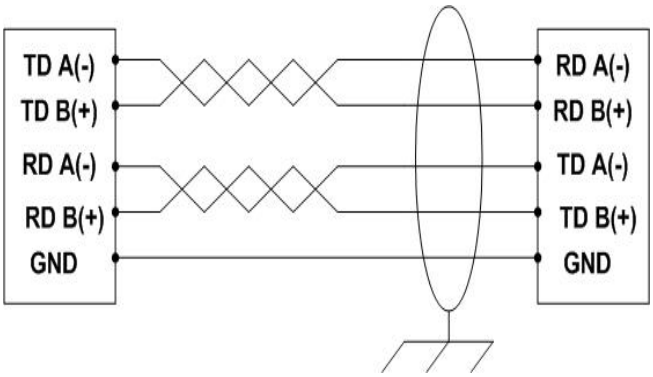
Figure 3: 4-wire RS-422

- Used as the master in a master/slave circuit with receive only slaves.
- Full-duplex communications.
- Requires a twisted pair for transmit, a twisted pair for receive, and a ground reference wire.
- Switch settings are: Switch 1: RS-422, Switch 2: Echo On, Switches 3 and 4: 4-wire.



DECLARATION OF CONFORMITY

Manufacturer's Name:	B&B Electronics Manufacturing Company
Manufacturer's Address:	P.O. Box 1040 707 Dayton Road Ottawa, IL 61350 USA
Model Number:	4WSDxxOTB
Description:	RS-422/485 Converter
Type:	Light industrial ITE equipment
Application of Council Directive:	89/336/EEC
Standards:	EN 55022 EN 61000-6-1 EN 61000 (-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11)

Michael J. Fahrion, Director of Engineering

CE

Specifications

Input Power Requirement	10 – 48 VDC
Isolation	2000 VAC
Current Draw	28 mA at 12 VDC (typical)
RS-232 Connection	DB9/DB25
RS-422/RS-485 Connection	Removable Terminal Block
Data Rate	Up to 115.2 kbps
Operating Temperature	32 – 158°F (0 - 70°C)
LED Indicators	TD and RD
Dimensions (4WSD9OTB)	3.9 x 1.7 x 0.9 in 9.8 x 4.3 x 2.3 cm
Dimensions (4WSD25OTB)	3.9 x 2.2 x 0.9 in 9.8 x 5.5 x 2.3 cm
Approvals	CE

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